

A NEW SPECIES OF *EUCOSMA* HÜBNER (TORTRICIDAE: OLETHREUTINAE) FROM THE TALL GRASS PRAIRIE REGION OF MIDWESTERN NORTH AMERICA

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ABSTRACT. *Eucosma haydenae*, new species, is described from Iowa and Illinois. This species, which seems to be a tall grass prairie obligate, is similar in appearance to *E. rusticana* (Kearfott) but is much smaller. A review of *rusticana* is included, and illustrations are provided for the adults and genitalia of both species.

Additional key words: Eucosmini.

The once pervasive tall grass prairie of the North American Midwest is now reduced to a scattered assortment of small disjunct patches, but those remnants still harbor insects that are rarely encountered elsewhere. This paper proposes a name for one such insect, a small brown moth described below as *Eucosma haydenae*, new species. It was discovered during faunal surveys in five prairie preserves, one in northeast Iowa, four in the vicinity of Chicago, Illinois. In general appearance it is most similar to *Eucosma rusticana* Kearfott, but the two species are separated easily by their marked difference in size.

Eucosma rusticana is distributed widely in eastern North America but is rather poorly represented in collections. Kearfott (1905) described the species based on six specimens. Klots (1942) reported two syntypes in the American Museum of Natural History (AMNH), including one labeled LECTOTYPE, a designation he attributed to Heinrich (1923). I examined the lectotype. The second syntype in the AMNH, reported by Kearfott (1905) from Algonquin, Illinois, was not found. I also examined four syntypes at the United States National Museum (USNM).

MATERIALS AND METHODS

This study is based on an examination of 97 adult specimens and 10 genitalia preparations from the following collections: AMNH, Loran D. Gibson, Todd Gilligan (TG), Mississippi Entomological Museum (MEM), USNM, Ron Panzer, and Donald J. Wright (DJW). Forewing length (FWL), defined as distance from base to apex (including fringe), was measured to the nearest one tenth of a millimeter. A rough indication of forewing geometry is provided by the aspect ratio (AR), defined as FWL divided by medial forewing width, the later measurement taken perpendicular to the dorsal margin. Costal fold ratio (CFR) is defined as costal fold length divided by FWL. Reported values of AR and CFR are averages, rounded to two decimal

places, of the corresponding values calculated for a small sample of specimens. The number of measurements or observations supporting a particular statement is indicated by n. Forewing pattern terminology follows Brown & Powell (1991) and Baixeras (2002).

SPECIES ACCOUNTS

Eucosma rusticana Kearfott

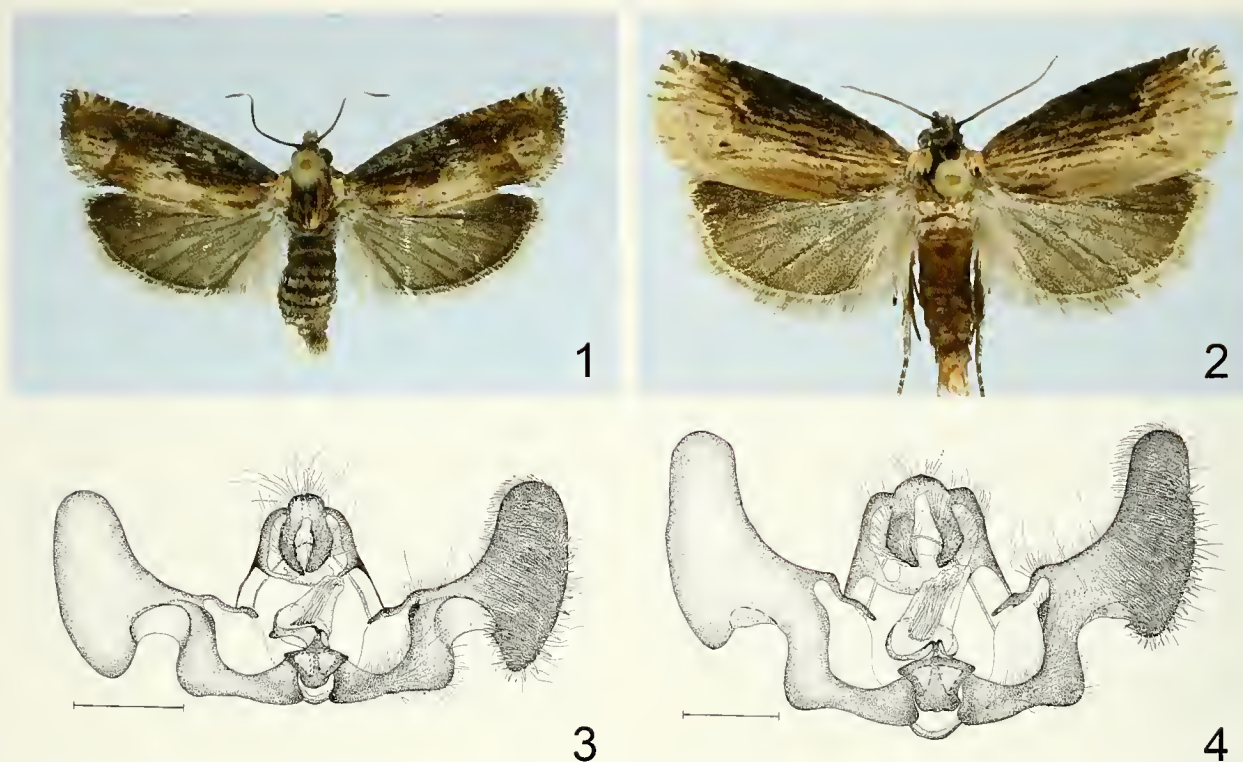
(Figs. 2, 4, 7, 8)

Eucosma rusticana Kearfott 1905:358; Barnes and McDunnough 1917:170; Heinrich 1923:125, Fig. 162; McDunnough 1939:47; Powell 1983:35.

Types. Lectotype designated by Heinrich (1923): ♂, Kerrville, Tex., AMNH. Paralectotypes. NORTH CAROLINA: Tryon, Fiske, 13 May 1903 (1 ♂, USNM), 28 May 1904 (1 ♂, USNM), 1 August 1904 (1 ♂, USNM, genitalia slide 70461), no date (1 ♀, USNM).

Remarks. *Eucosma rusticana* is identified by the following forewing characteristics: dorsal surface (Fig. 2) divided longitudinally into a blackish-brown anterior region and a brownish-tan dorsoterminal region, the line of separation running roughly along the cubital vein from base to ocellus and from there obliquely outward to costa just short of apex; region between said line and dorsal margin crossed longitudinally by three or four brown streaks; ocellus with pale-tan central field, bordered basally and distally by indistinct, transverse, silvery-gray bars and crossed longitudinally by two, variably expressed, dark-brown dashes; ninth costal strigula white and conspicuous, other costal strigulae gray and obscure. In melanic specimens the anterior region of the forewing is nearly all black, with black suffusion extending to dorsum, but the streaked appearance of the dorsal region is still apparent. Forewing statistics: ♂ FWL 9–12 mm (mean = 10.3, n = 25), AR = 2.57, CFR = 0.47, ♀ FWL 9.9–12.2 mm (mean = 11.2, n = 5), AR = 2.43.

Male genitalia (Fig. 4) (n = 2): Uncus convex and moderately developed, socii long and setose, dorsolateral shoulders of tegumen well developed, gnathos a narrow band; vesica with ca. 22 deciduous cornuti, valva with dorsal margin strongly concave, apex rounded.



FIGS 1–4: Adults and male genitalia. 1, *haydenae*, holotype. 2, *rusticana*, Rowan Co., Kentucky. 3, *haydenae*, Howard Co., Iowa, slide DJW 556. 4, *rusticana*, Wyandot Co., Ohio, slide DJW 167. Scale bars = 0.5 mm

ventral two thirds of distal margin convex, dorsal one third mildly inset, producing narrowing of apical one third of cucullus, anal angle rounded, neck with scooped out invagination of ventrolateral margin (indicated by dashed line in Fig. 4), corner of sacculus rounded and nearly right-angled, margin of basal opening with weakly developed medial projection supporting a small patch of spines. **Female genitalia** (Fig. 8) ($n = 2$): papillae anales small, facing laterally and sparsely setose; sterigma (Fig. 7) semirectangular, length ca. 1.5x width, with shallow trough from center of posterior margin to ostium, lamella antevaginalis ringlike and very weakly sclerotized, lamella postvaginalis with lateral and posterior surfaces densely microtrichiate; posterior margin of sternum VII invaginated to three fourths length of sterigma and closely approximate thereto; ductus bursae short, of nearly uniform width, with variably sclerotized ring posterior to juncture with ductus seminalis; corpus bursae with two, large, fin-shaped signa, inner surface of membrane microtrichiate.

Biology and distribution. I examined 52 specimens (46 ♂, 6 ♀) from Arkansas, Illinois, Indiana, Kentucky, Missouri, Mississippi, North Carolina, Ohio, Tennessee, Texas and Wisconsin. The flight period extends from mid April to mid August, the earliest records coming from Mississippi. Midwest records are predominantly from June and July. No larval host has been reported, but other members of the genus are known to be stem and root borers of *Asteraceae*.

Eucosma haydenae new species

(Figs. 1, 3, 5, 6)

Diagnosis. Size and forewing maculation distinguish *haydenae* from other eastern North American species of

Eucosma. Mean FWL of superficially similar *rusticana* is ca. 3 mm longer than that of *haydenae*. Distinctive male genitalic characters include the scooped out invagination of the medioventral surface of the valval neck and the rounded anteroventral projections of the anellus. The sclerotized twist in the female ductus bursae is prominent but not unique to this species.

Description. **Head:** Lower frons creamy white, upper frons creamy white to light brown, vertex brown, scales adjacent to eye lighter; labial palpus with basal segment white, second segment with medial surface and dorsal margin white, lateral surface gray brown with white medial mark, third segment brown, often with blackish-brown apex; antenna with dorsal surface brown, posterior surface white. **Thorax:** Dorsal surface orange brown, scales at posterior extremity of tegula shading to tan, ventral surface creamy white, fore and midlegs with anterior surfaces pale gray brown, posterior surfaces white, hindlegs white to tan, midtibia with white, oblique, medial mark on anterior surface, fore and mid tarsi with pale white annulations. **Forewing** (Fig. 1): ♂ FWL 6–8.2 mm (mean = 7.3, $n = 29$), AR = 2.82, CFR = 0.48, ♀ FWL 7.5–8.2 mm (mean = 7.9, $n = 2$), AR = 2.71; costa weakly convex, apex nearly right-angled, termen weakly convex; dorsal surface with blackish-brown region bounded anteriorly by basal one half of costa, posteriorly by cubital vein and distally by end of discal cell, region between cubital vein and dorsum white to tan, with orange-brown suffusion near base and along basal margin of ocellus, a narrow, sometimes interrupted, brown streak along dorsal margin; ocellus bordered basally and distally by silvery-gray transverse bars, central field light tan, crossed longitudinally by up to four, variably expressed, thin, black dashes; orange-brown scaling along distal one half of costa, crossed by five, paired, white to gray strigulae and their associated silvery-gray stria; ninth costal strigula white; fringe gray brown anteriorly, becoming paler toward

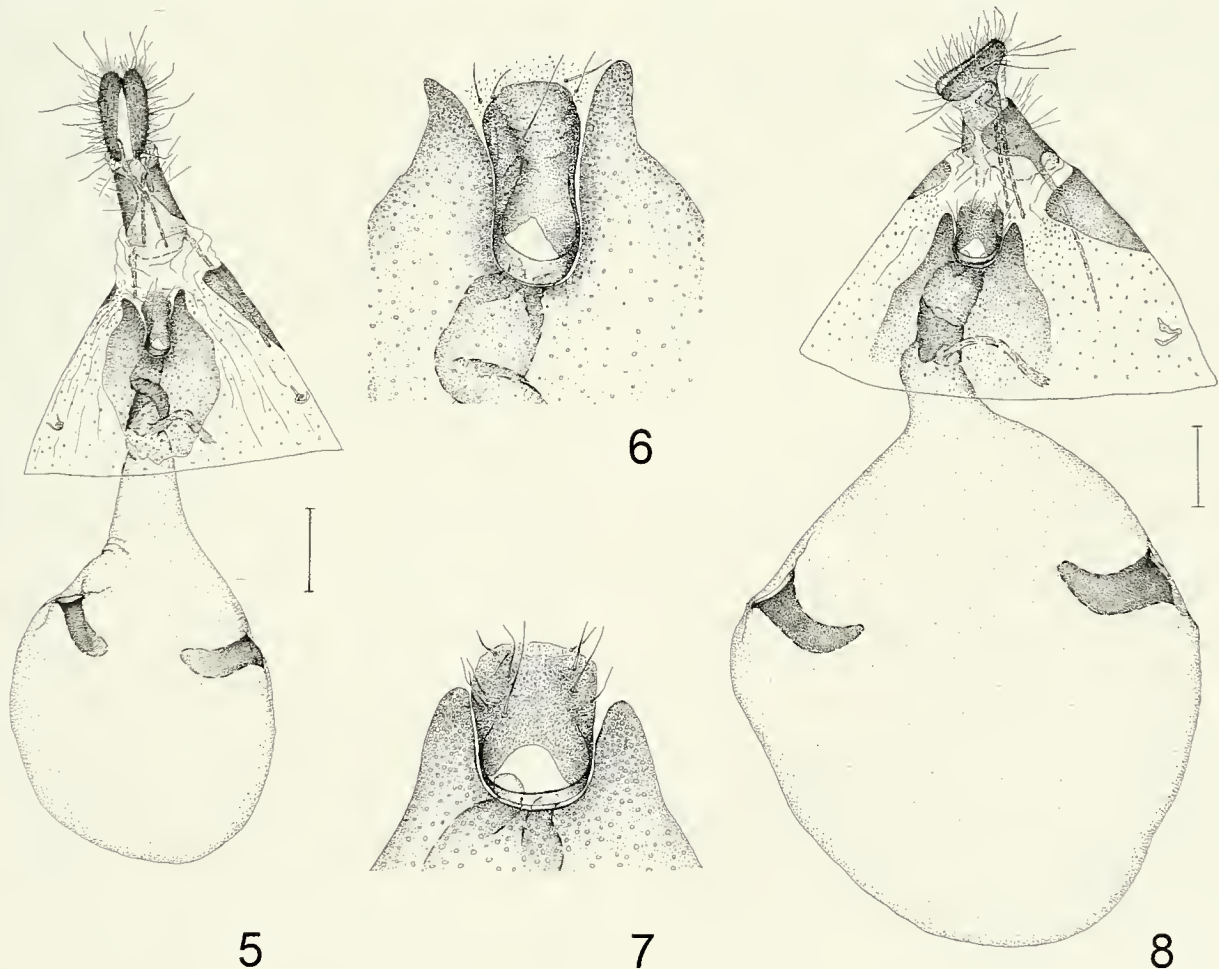
tornus. *Male genitalia* (Fig. 3) ($n = 4$): Uncus a rounded, dorsally setose lobe, divided medially by shallow indentation; socii long and densely setose; gnathos a narrow band, aedeagus tapered distally, vesica with ca. 22 deciduous cornuti; anellus with small rounded projections at anteroventral extremities; valva with costal margin strongly concave, apex evenly rounded, distal margin convex, ventral angle narrowly rounded, neck with strongly scooped out invagination of medioventral margin, cucullus with medial surface densely setose and with ca. 10 stout setae evenly distributed along distal margin, sacculus moderately setose, margin of basal opening with narrow raised pulvinus, the latter connected to neck by weakly developed ridge. *Female genitalia* (Fig. 5) ($n = 2$): papillae anales small, facing ventrally and moderately setose; sterigma (Fig. 6) long and semirectangular, length more than $2\times$ width, lamella antevaginalis ringlike and weakly sclerotized, lamella postvaginalis with lateral ridges bordering shallow medial trough, surface microtrichiate; sternum VII with posterior margin deeply and narrowly invaginated to length of sterigma, closely approximate to sterigma; ductus bursae with sclerotized twist posterior to juncture with ductus seminalis; corpus bursae with two fin shaped signa posterior to mid bursa, inner surface microtrichiate.

Holotype. ♂, IOWA, Howard Co., Hayden Prairie, 23 June 1997, D. J. Wright, deposited in USNM. Type locality at $43^{\circ}26'35''$ N, $92^{\circ}22'58''$ W.

Paratypes. ILLINOIS: Dupage Co., W. Chicago Prairie, R. Panzer, 23 May 2004 (5 ♂, 2♀, ♂ genitalia slide DJW1291, ♀ genitalia slides DJW1290 & 1296), 6 June 2004 (1 ♂); Lee Co., Green River E., 6 July 2002 (1 ♂). IOWA: Same locality as holotype, D. J. Wright, 21 June 2000 (1 ♂), 23 June 1997 (8 ♂, genitalia slide DJW 556), 28 June 1995 (2 ♂, genitalia slides DJW 131 & 206), T. Cilligan (2 ♂). Paratype depositories: AMNH, TG, MEM, USNM, DJW.

Etymology. Dr. Ada Hayden (1884–1950) was a botanist at Iowa State College (now Iowa State University) who devoted much of her professional life to the study of the native Iowa prairie (Isely, 1989). Her advocacy in the 1940's for conservation of prairie habitat was largely responsible for the preservation of the 240 acre tract in northeast Iowa that now bears her name and serves as the type locality for the moth described here. It's a pleasure to name this insect after Dr. Hayden.

Distribution and biology. I examined 45 specimens (43 ♂, 2♀), documenting a flight period from late May to



FIGS. 5–8: Female genitalia. 5–6, *haydenae*, Dupage Co., Illinois, slide DJW 1290. 7–8, *rusticana*, Cook Co., Illinois, slide DJW 1289. Scale bars = 0.5 mm.

the beginning of July. All were collected in remnant tall grass prairie habitat in Howard County, Iowa, and in Cook, Dupage, and Lee Counties in Illinois. The larval host is not known but, as with *rusticana*, is probably a species of *Asteraceae*.

Remark. The *haydenae* specimens from the Chicago area have a generally blacker appearance than those from Iowa.

ACKNOWLEDGEMENTS

I thank J. W. Brown, R. L. Brown, and R. T. Schuh for the loan of specimens under their care. Karl Gnaedinger generously supplied me with specimens from the Chicago area, and D. Howell, Iowa Department of Natural Resources, helped with permits to sample the Hayden Prairie fauna and with biographical information on Ada Hayden. Two anonymous reviewers offered helpful comments on the manuscript.

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Received for publication 6 January 2006; revised and accepted 19 June 2006